(Un)consciousness

• Can we act on something without being conscious of it?
  – In this post-behaviorist age, we can study this question again
  – Unconscious actions cast doubt on the impression that we are “in control”
  – Do we all have multiple “I”s?
People show Ebbinghaus illusion when asked “Which is larger?” but not when asked to reach for the middle circle.
Meaning without awareness of word (Marcel)

• “Was word present?” is at chance but
• “Which word is related?” is better than chance
• Results are contrary to traditional information processing stages of first sensory, then semantic
• Early priming based on meaning

Present or absent (Y/N)? Is “Doctor” or “Street” related?
Being famous without being recognized (Jacoby)

- Read subjects a list of non-famous names to remember
  - Peter Franklin, Mary Evans, Philip Zoronski, etc.
- One day later, have subjects rate how famous different names are, and try to recognize old names from list
  - Famous names: Sally Fields, John Dean
  - New non-famous name: Penny Steven
  - Old non-famous name: Mary Evans
Being famous without being recognized

- If name is recognized, then the probability of saying that the old non-famous is famous is **LESS** than for a new non-famous name
- If name is not recognized, then the probability of saying that the old non-famous name is famous is **MORE** than for a new non-famous name
- Dissociation: Opposite effects of name if consciously versus unconsciously in memory
Cross over interaction: Conscious use of memory (more likely if full attention) is opposite to unconscious use of memory (more likely when divided attention)

Fig. 1. Probability of judging a non-famous name famous after reading a list on which the name appeared. A false fame effect is shown after divided attention.
Process Dissociation Framework

- Separate (Dissociate) unconscious from controlled processes
- Inclusion condition: Respond any way you want
- Exclusion condition: Don’t respond with consciously remembered item
  - “Being famous without being recognized” study has an implicit exclusion condition
  - Don’t respond “famous” if you consciously remember seeing the name on the list
Word Fragment Completion Example

• See words (including HEAD) on list, with full or divided attention
  – Divided attention: listen for runs of 3 odd digits
• Inclusion: Give any word that completes HEA_
• Exclusion: Give any word that you don’t remember from the list that completes HEA_
• \[ P(\text{Producing word in inclusion task}) = R + A(1-R) \]
• \[ P(\text{Producing word in exclusion task}) = A(1-R) \]
• \( R\) = Probability of consciously recalling word
• \( A\) = Automatically (unconsciously) remembering word
\[ P(\text{Producing word in inclusion task}) = R + A(1-R) \]

\[ R = \text{conscious recollection}, \ A = \text{Automatic, unconscious activation} \]

\[ P(\text{Producing word in exclusion task}) = A(1-R) \]

\[ .61 = R + A(1-R) \]

\[ .61 = R + .36 \]

\[ .36 = A(1-R) \]

\[ R = .25, \ A = .48 \]

Dividing Attention hurts conscious recollection, but not automatic activation

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<th>Test performance</th>
<th>Estimate of memory effects</th>
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Word fragment completion task preceded by brief presentation of a word that completes the fragment

Exclusion: Don’t use the flashed word

Inclusion: Use any word

Fig. 2. Estimates of conscious and unconscious perception of words flashed briefly. Dividing attention during the brief presentation of a word reduces conscious perception but does not change unconscious perception.
Blind sight

- Caused by scotomas (dark spots) in occipital lobe region
- Primary visual pathway is disrupted, but others remain
- Patient feels like they are blind, but they avoid obstacles, and can “guess” the location of a light very accurately.
- Problem with voluntary, willed action
  - Won’t reach for water in blindspot if thirsty
- Analogs in people with normal vision
  - Parafoveal vision
  - Cases where task requires accessing which eye received information
Blind sight patient

Motion judgment= "Which direction did light travel?"

Awareness judgment="Did you have any experience at all of the event?"

Good discrimination at all speeds, but unaware of motion for slower speeds

(Weiskrantz, 1995)

Fig. 2. Example of C.Y.'s performance when asked to discriminate movement of a spot in his "blind" hemifield, as a function of different speeds, using a two-alternative forced-choice procedure. The excursion of the movement in this condition was always 20° (see inset). Shown are the percentage of trials on which he was aware of the stimulus and the percentage of trials on which his discrimination was accurate, both overall and for trials on which he was unaware of the stimulus. Similar results were obtained when C.Y. was asked to discriminate movement using different lengths of excursion, varying angles of horizontal versus oblique movement, and varying levels of luminous contrast. From Weiskrantz, Barbur, and Sahraie."
Blind sight in normals (Kolb & Braun, 1995)

- Task: “In which quadrant were the odd oriented bars?”
- Also collect confidence judgments
- Rivalrous display: “/”s in left eye’s images are always paired with “\”s in right eye’s image
- For rivalrous displays, accuracy is unrelated to confidence
- Only conscious of information which projects to the frontal regions of the cortex?
- Information about which eye received information is preserved in V1, but lost at deeper levels in the cortex
bars = accuracy given a confidence level
lines = frequency of a given confidence rating
Unconscious priming

• Automatic priming from one object to the next
• Just before object, flash priming word
• Neutral object interpreted to be consistent with prime
  – Is Doug’s remark about the speech rude or honest?
• Judge “Good” or “bad”: Faster to make decision if priming word has the same value (“valence”) as a following word
• Primitive unconscious influence: the prime “enemy fails” is negative, not positive.
Implicit Attitude Test
http://buster.cs.yale.edu/implicit/

- Two categorization tasks
  - Task 1:
    - Press “1” for a black face or a positive word like ‘victory’
    - Press “2” for a white face or a negative word like ‘loser’
  - Task 2:
    - Press “1” for a black face or a negative word like ‘loser’
    - Press “2” for a white face or a positive word like ‘victory’

- For white subjects, Task 2 is typically easier than Task 1
  - white subjects do not indicate a conscious preference for white people
  - Task 1 is easier than Task 2 for black subjects

- Other implicit attitudes
  - Old is bad, young is good
  - Women go with humanity majors, men with science
  - Your own political party is good

- Does the implicit attitudes test measure racism?
If we can do so much unconsciously, what is consciousness for?

- Organizes and structures thoughts
- Consciousness as a bottleneck for highlighting specific important aspects of the world